

Exercise 12

Differentiate.

$$f(z) = (1 - e^z)(z + e^z)$$

Solution

Use the product rule to differentiate $f(z)$.

$$\begin{aligned} f'(z) &= \frac{d}{dz} [(1 - e^z)(z + e^z)] \\ &= \left[\frac{d}{dz}(1 - e^z) \right] (z + e^z) + (1 - e^z) \left[\frac{d}{dz}(z + e^z) \right] \\ &= (-e^z)(z + e^z) + (1 - e^z)(1 + e^z) \\ &= (-ze^z - e^{2z}) + (1 + e^z - e^z - e^{2z}) \\ &= 1 - ze^z - 2e^{2z} \end{aligned}$$